Senrigan-GP-45 Brushless Gimbal Instruction Manual v1.1

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1. Introduction

Introduction:

Brushless Gimbal is the next generation technology for high quality aerial photography. Senrigan GP-45 Brushless Gimbal is driven directly with two Brushless Motors for two axis movement roll and tilt without gears or belts. The main advantages of this design compared to traditional actuators (servos) are the Brushless Gimbals have no backlash in the gear/belt, and it provides the instantaneous response to the disturbance. Due to lack of gears/ belts, this new Brushless Gimbal is extrenely easy to install and with low weight which is perfect for aerial activities. The lower the weight, the longer the flying time you can achieve.

Differ than others, the motors and Gimbal Controller of Senrigan GP-45 Brushless Gimbal have been well test and tuned of the PID parameter for GoPro Cameras in the factory before selling. So no worries about the setting or PID tuning of the Brushless Gimbal. Furthermore, with an Advanced Landing Gear Set you will be able to install the Senrigan GP-45 Brushless Gimbal onto DJIF450/ 550/ other Multicopters effortlessly. Last but not the least, a detailed instruction manual could be downloaded freely in the internet.

Features:

-Direct drive of Brushless Motors for both Roll and Tilt axis.
-Advanced Landing Gear Set (with battery mount) which is best fit on F450/550 Multicopters.
-Simple and strong Mechanism Design
-Made of CNC Metal Parts and full Carbon Fiber Frames which is super light and strong.
-Super Steady Performance with high quality Rubber Tension Damper Balls.
-High Quality Brushless Gimbal Controller (Pre-programmed) with High Quality CNC Casing.
-Well test and PID parameter tuned by the factory for GoPro/ Similar size cameras.
-Controllable Tilt Axis Movement with Max. 90 Degree
-Easy to install and use.
-Ligh in weight.

Specification:

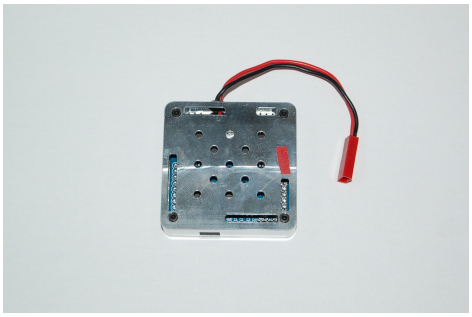
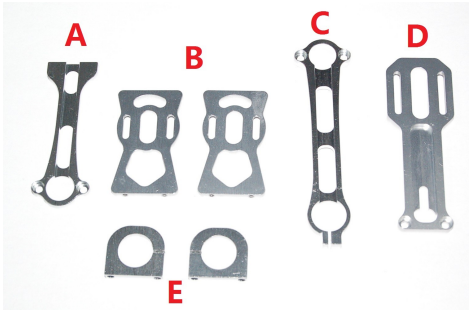
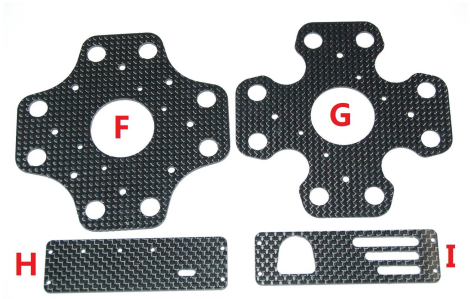
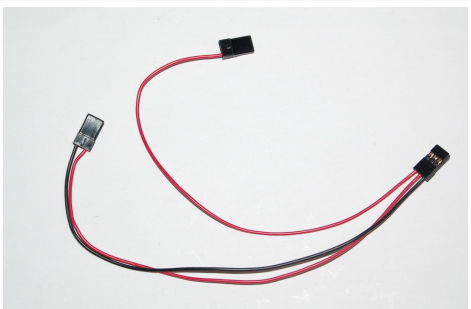
-Movement: 2-axis, Roll and Tilt
-Controllable axis: Tilt +-60 Degree, Roll +-80 Degree
-Working Voltage: 3S 11.1V Lipo
-Gimbal Controller Weight (with casing): 47g
-Brushless Gimbal with Controller: 240g
-Total Weight with Landing Gear(without camera): 506g

Included:

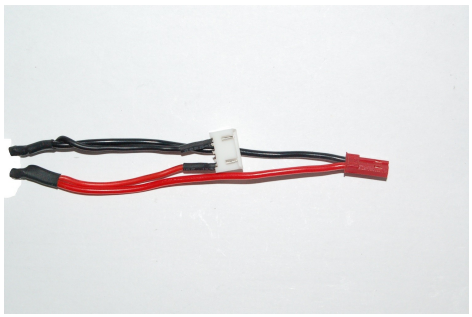
1x Senrigan GP-45 Brushless Gimbal
1x Senrigan Brushless Gimbal Controller(Pre-programmed) with High Quality CNC Casing
1x IMU Unit
8x High Quality Rubber Tension Damper Balls
1x Advanced Landing Gear Set with Battery Mount (For DJI F450/550)
1x Tilt and Roll Controlling Connector
(Please be noted that GoPro, Aircraft and Battery are not included.)

2. Check List

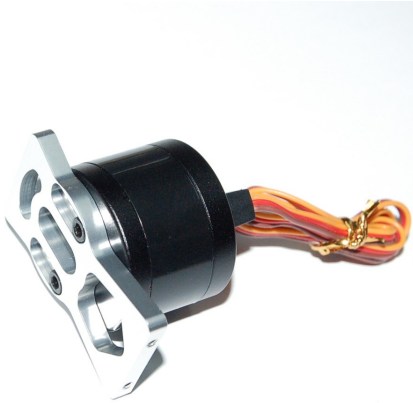
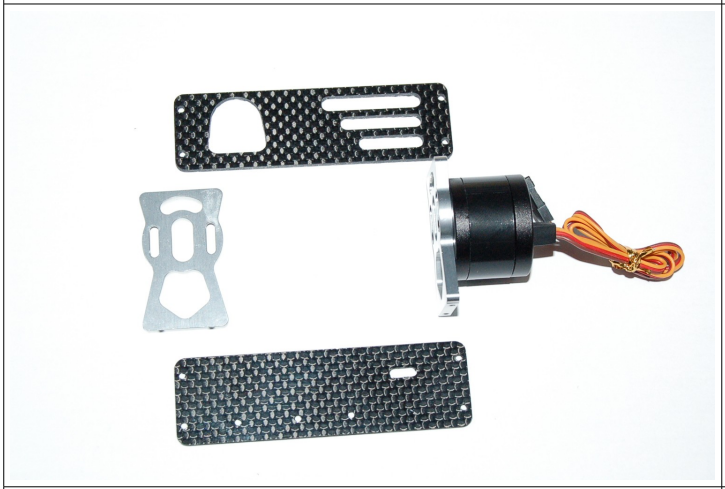
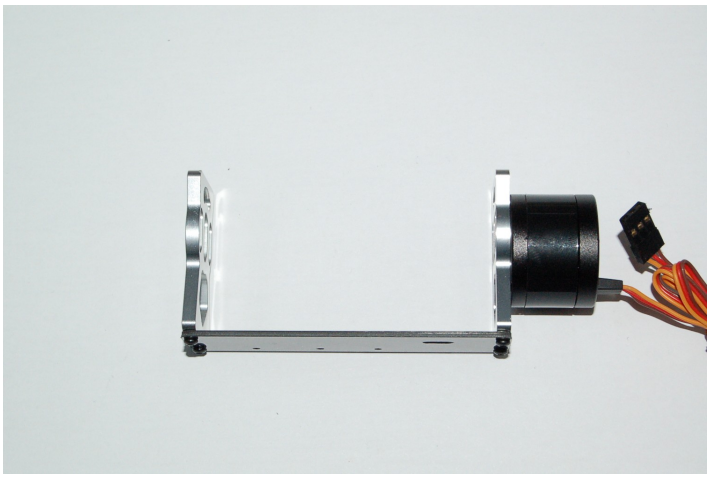
Please Check the Follow parts.

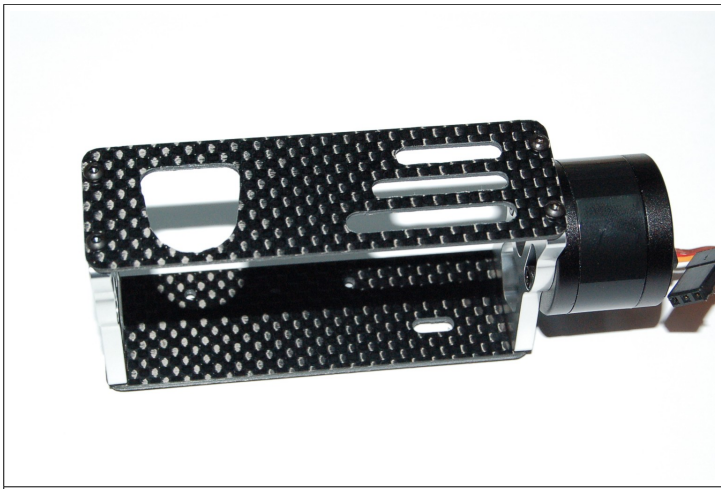
		
BL Gimbal Controller 1pcs	IMU Unit 1pcs	BL Gimbal Motor 2208 2pcs
		
CNC Metal Parts: A: Tilt TR Coupler – 1pcs B: Stand Frame Mount – 2pcs C: Spine Mount – 1pcs D: Roll TR Coupler – 1pcs E: Boom Mount – 2pcs	Carbon Fiber Plates: F: Top Mounting Plate – 1pcs G: Bottom Mounting Plate – 1pcs H: Bottom Stand Plate – 1pcs I: Top Stand Plate – 1pcs	Coupler Carbon Boom 1pcs
		
Rubber Tension Damper Balls 8pcs	Screw Pack 1pcs	Tilt and Roll Controlling Connector 1pcs
	Advanced Landing Gear Set 1pcs	

3. Equipment Required For Assembly

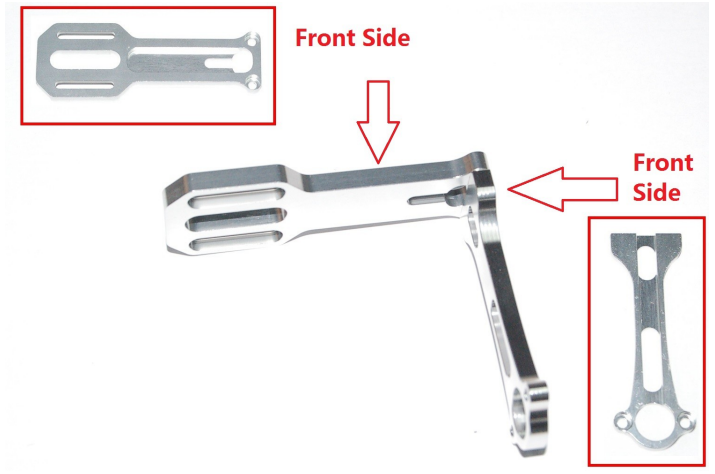
		
1pcs Gopro Camera (v1,2 or 3)	1pcs 3S 11.1V Lipo 800mAh (or above) or 1pcs JST to 3S Lipo Balance Connector. *(Used to supply power to the Gimbal.)*	

4. Assembly Steps – Mechanism Parts

	
Step 1. Recognization of BL Gimbal Motor oriantation.	Step 2. Install a Stand Frame Mount onto the Front Side of BL Gimbal Motor using M2.5x6mm Hex Cap Screws. This is the Tilt Axis. *(Apply little amount of Thread Locker when securing screw to metal parts.)*
	
Step 3. Prepare 1x Bottom Stand Plate, 1x Top Stand Plate, 1x Stand Frame Mount and the Assembly from Step 2.	Sep 4. Install the Bottom Stand Plate with two Stand Frame Mounts using 4x M2x6mm Hex Cap Screws. *(Apply little amount of Thread Locker when securing screw to metal parts.)*

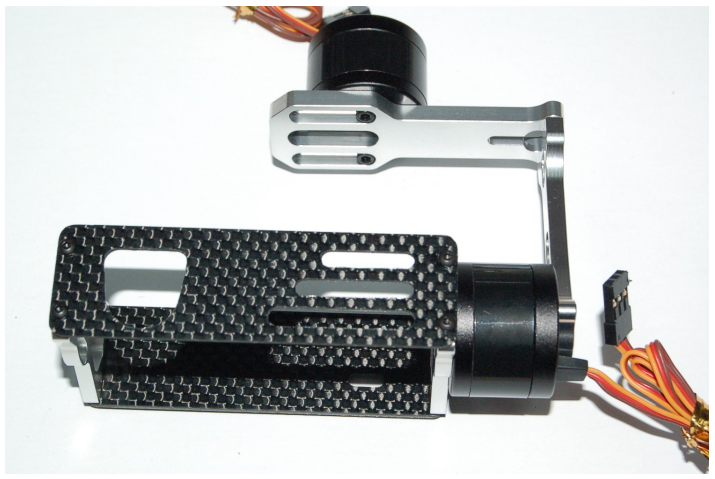


Step 5.
Install the Top Stand Plate onto the Stand Frame Mounts using 4x M2x6mm Hex Cap Screws.
(Apply little amount of Thread Locker when securing screw to metal parts.)

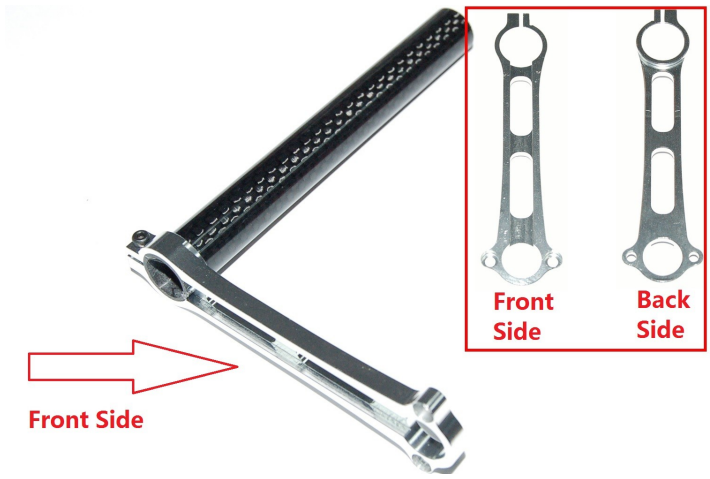


Step 6.
Install the Roll TR Coupler with Tilt TR Coupler using M2.5x6mm Hex Cap Screw.
(Apply little amount of Thread Locker when securing screw to metal parts.)

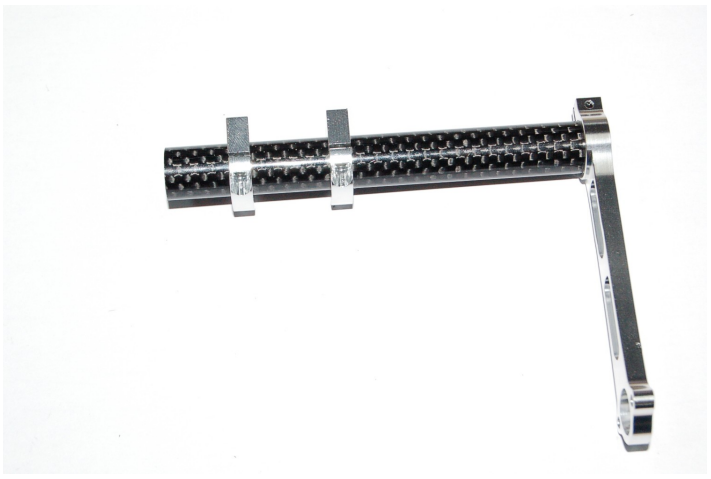
Step 7.
Install another BL Gimbal Motor onto the Roll TR Coupler using M2.5x6mm Hex Cap Screws. This is the Roll Axis.
(Apply little amount of Thread Locker when securing screw to metal parts.)



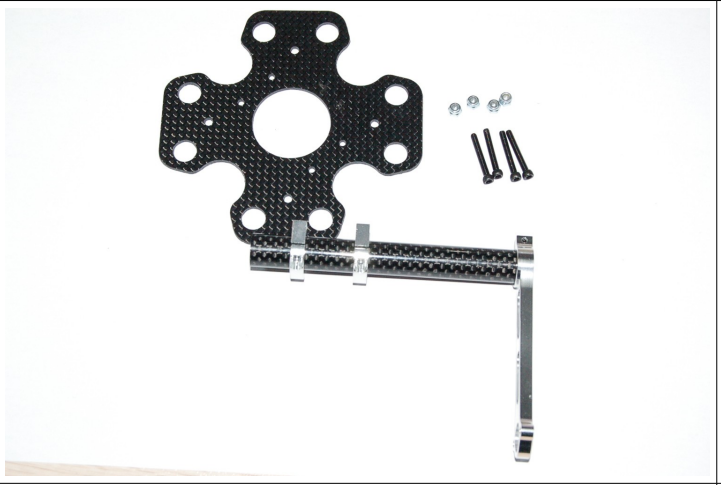
Step 8.
Install the BL Gimbal Motor of step 5 Assembly onto the Tilt TR Coupler using M2.5x6mm Hex Cap Screws.
(Apply little amount of Thread Locker when securing screw to metal parts.)



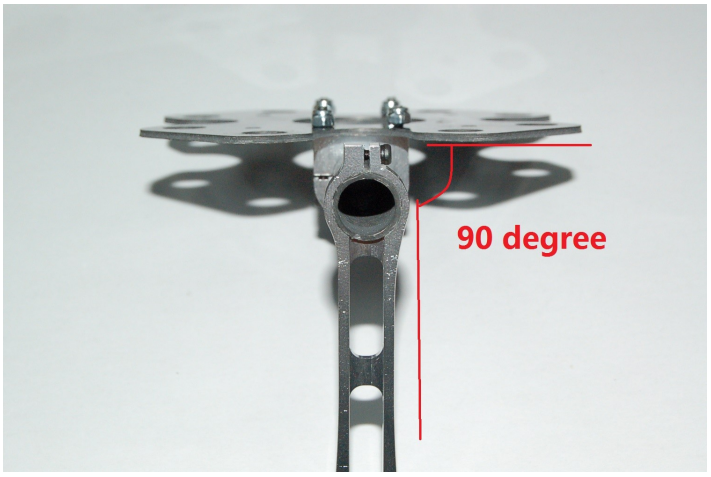
Step 9.
Install the Coupler Carbon Boom with Spine Mount using M2x6mm Hex Cap Screw.
(Apply little amount of Thread Locker when securing screw to metal parts.)



Step 10.
Insert two Boom Mounts onto the Coupler Carbon Boom.

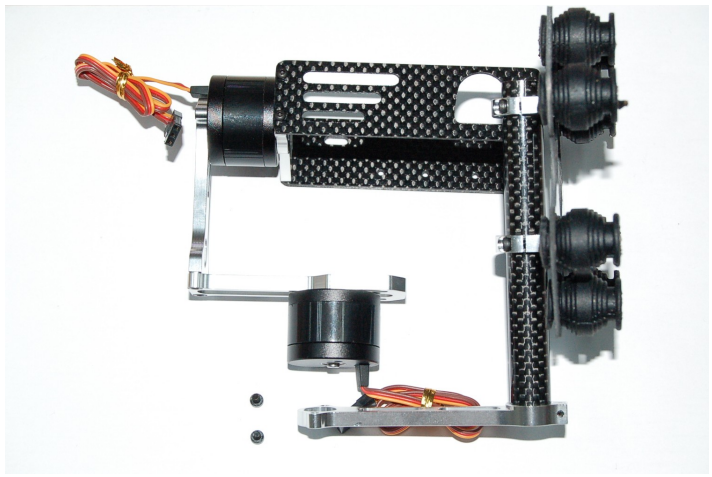


Step 11.
Prepare the Assembly from step 10 and the Bottom Mounting Plate.



Step 12.
Install the Bottom Mounting Plate onto the Boom Mounts using M2.6x18mm Hex Cap Screws with M2.5 Self Lock Nuts.

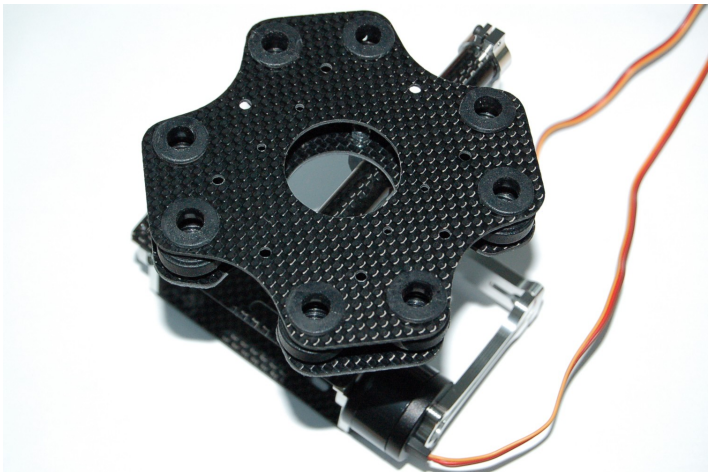
Step 13.
Insert 8pcs Rubber Tension Damper Balls onto the Bottom Mounting Plate.



Step 14.
Install the Spine Mount onto the Roll Axis BL Gimbal Motor using M2.5x6mm Hex Cap Screws.
(Apply little amount of Thread Locker when securing screw to metal parts.)

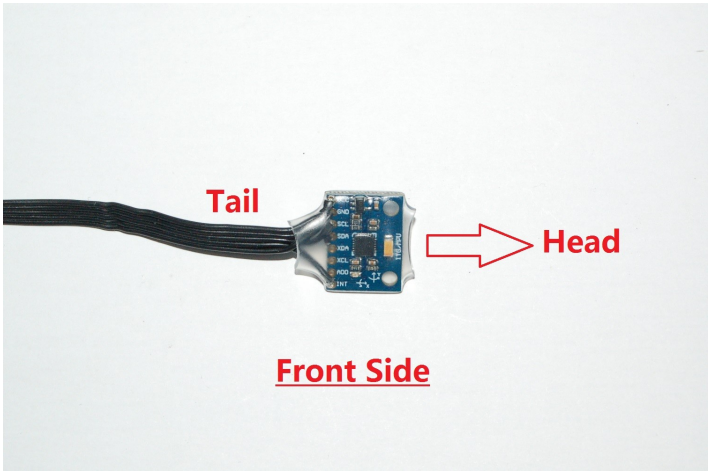
Step 15.
Close view of step 14.

Step 16.
Senrigan GP-45 Gimbal mechanism assembly view.

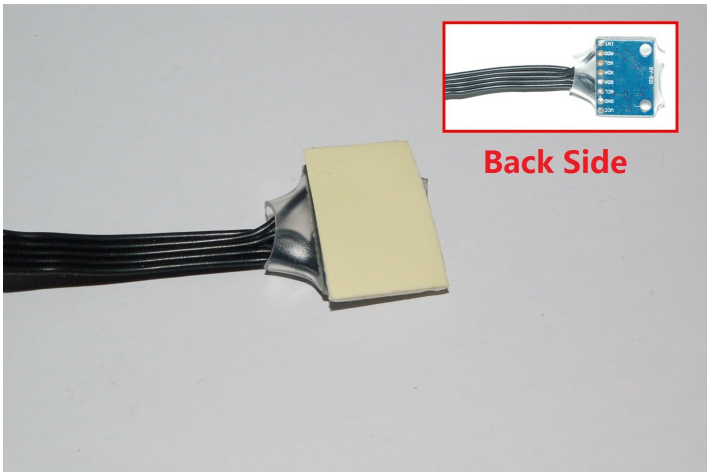


Step 17.
Insert 8pcs Rubber Tension Damper Balls onto the Top Mounting Plate.

5. Assembly Steps – IMU Mounting

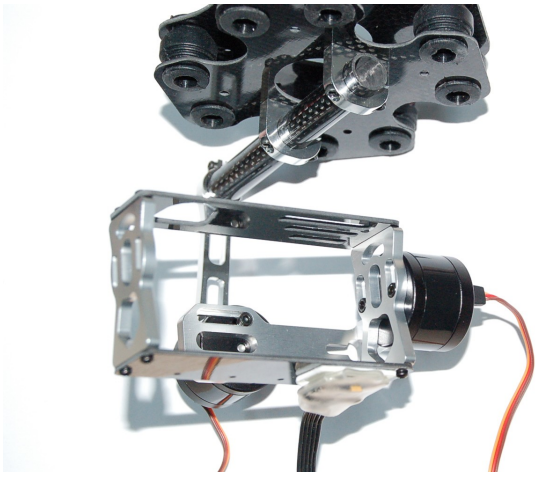


Step 1.
Prepare the IMU Unit. There is a specific orientation requirement to mount the IMU Unit.

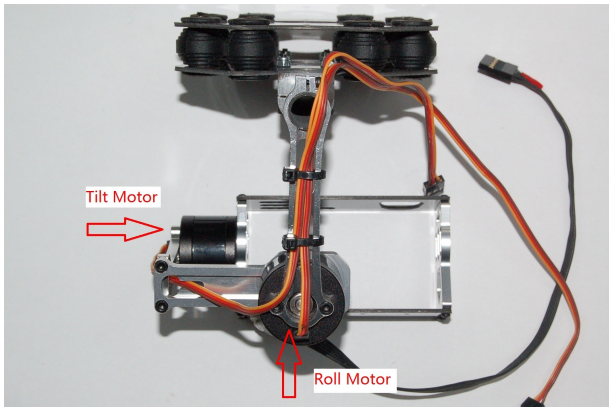


Step 2.
Use a double-sided foam tape to stick onto the back side of IMU Unit.

Step 3.
Stick the IMU Unit onto the Bottom Stand Plate using double-sided foam tape. Check the double faced adhesive tape regularly to ensure that the IMU is securely positioned. *(Ensure the orientation of the IMU is installed correctly.)*

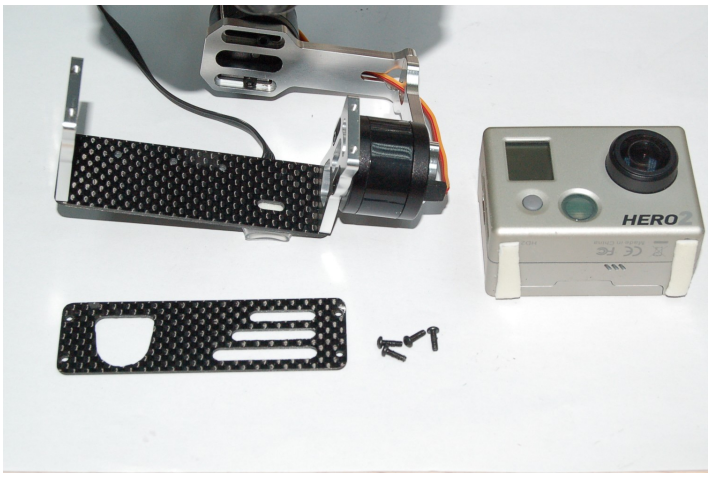


Step 4.
Close view for the IMU installation.



Step 5.
Arrange the cables of the Tilt BL Gimbal Motor and Roll BL Gimbal Motor with a zip tie.

6. Assembly Steps – CG Adjustment

<table>
<tr>
<td> 
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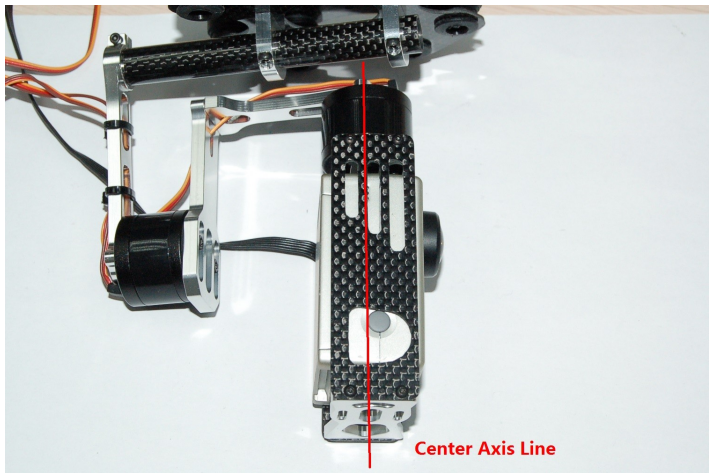
<td> 
</td>
</tr>
<tr>
<td>Step 1.
Release the Top Stand Plate and prepare your own GoPro or cameras with similar weight. Use double-sided foam tape to secure the GoPro in the center of the Bottom Stand Plate.</td>
<td>Step 2.
Adjust the position of the Camera to the center axis of Tilt Motor.</td>
</tr>
<tr>
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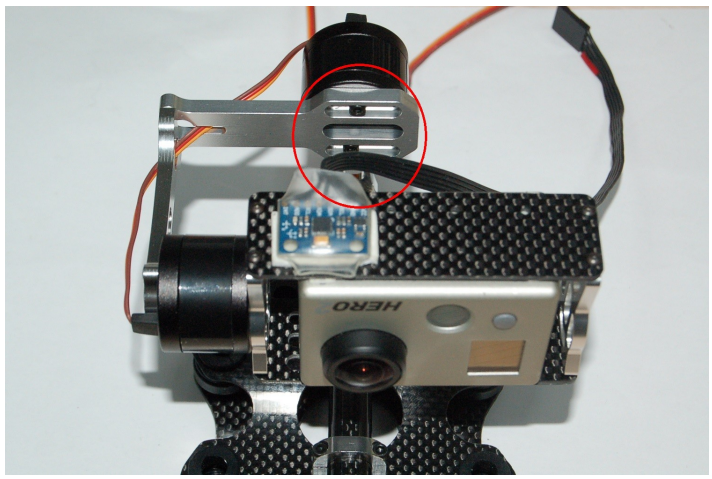
<td> 
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<tr>
<td>Step 3.
Secure the GoPro by installing the Top Stand Plate back to the Stand Frame Mount using 4pcs M2x6mm Screws. (Apply little amount of Thread Locker when securing screw to metal parts.)</td>
<td>Step 4.
Adjust the balance point of the Roll Axis by loosing two M2.5x6mm Screws on the Roll Motor as to move the Roll TR Coupler to left or right side. (Make sure the GoPro stay level which indicate the correct CG position. This is very important for steady operation of the Gimbal.)</td>
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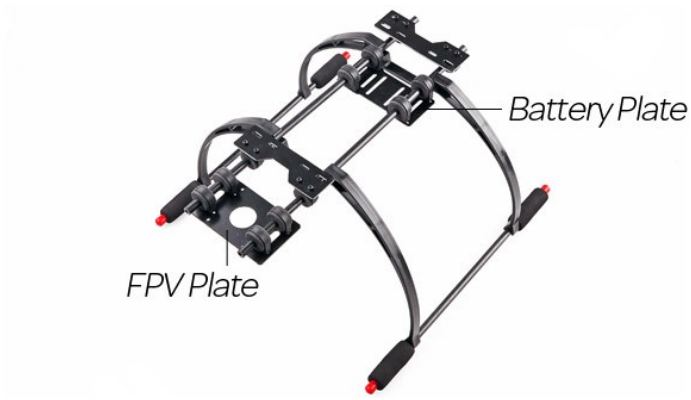
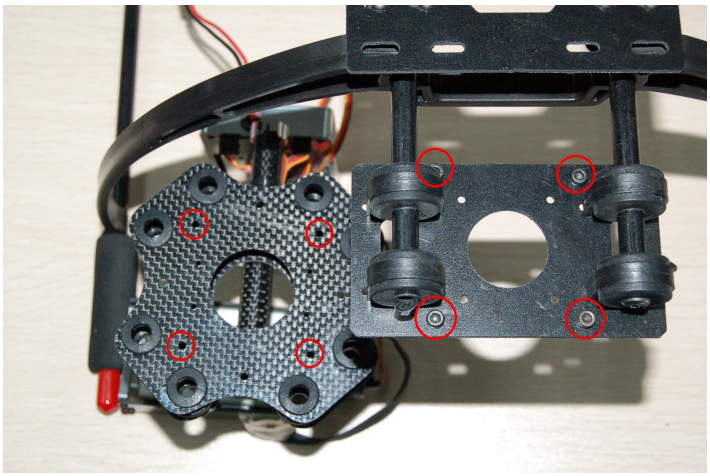
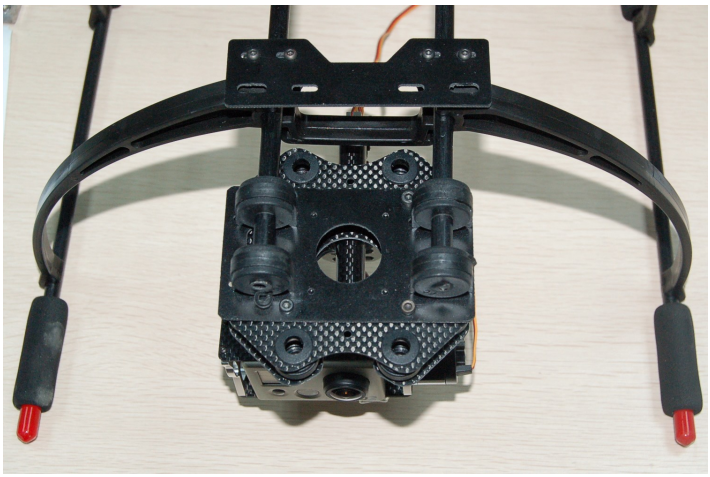
7. Assembly Steps – Install with Landing Gear



Step 1.
Install the Advanced Landing Gear according to the above photo. *(Apply little amount of Thread Locker when securing screw to metal parts.)*



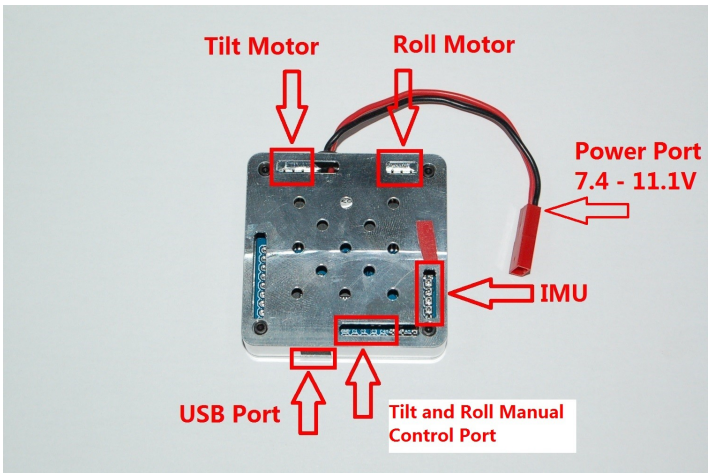
Step 2.
Mount the Gimbal Assembly onto the FPV Mount Plate using 4pcs M3x 10mm Hex Cap Screws with M3 Self-Lock Nuts.



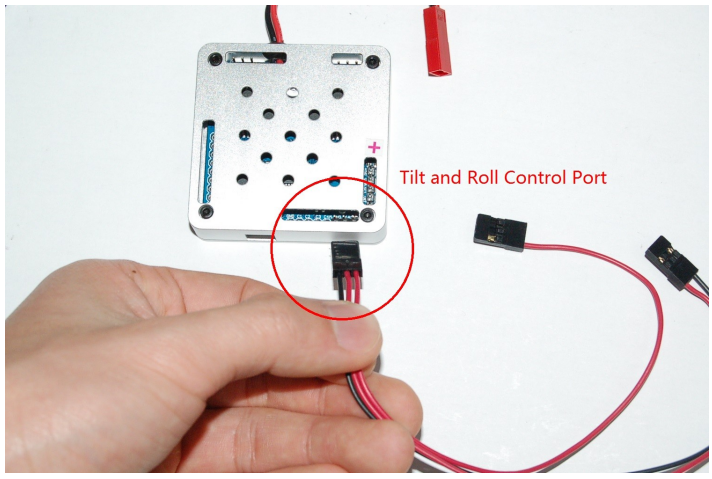
Step 3.
Finished Gimbal Assembly with the Advanced Landing Gear.

Step 4.
Illustration to install with DJI F550 Hexacopter.

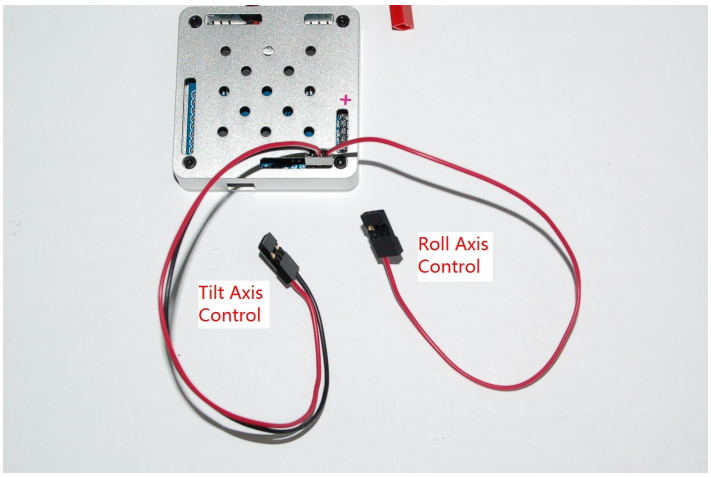
8. Assembly Steps – Gimbal Controller Board



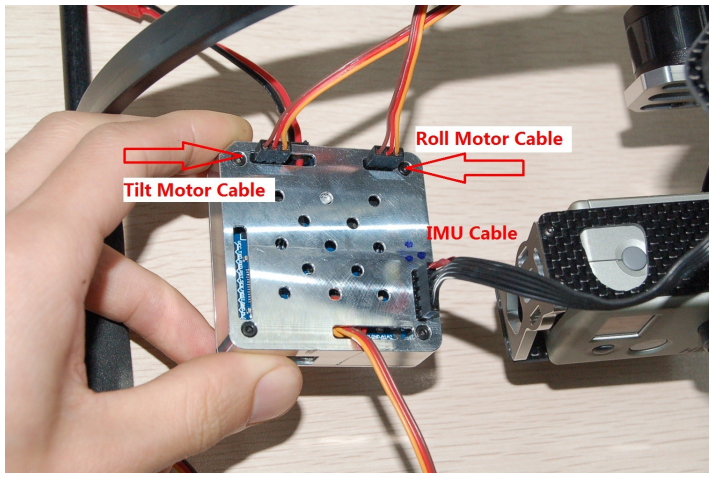
Step 1.
Usage of different ports on the Gimbal Controller.
(Best working power is 11.1V 3S Lipo.)



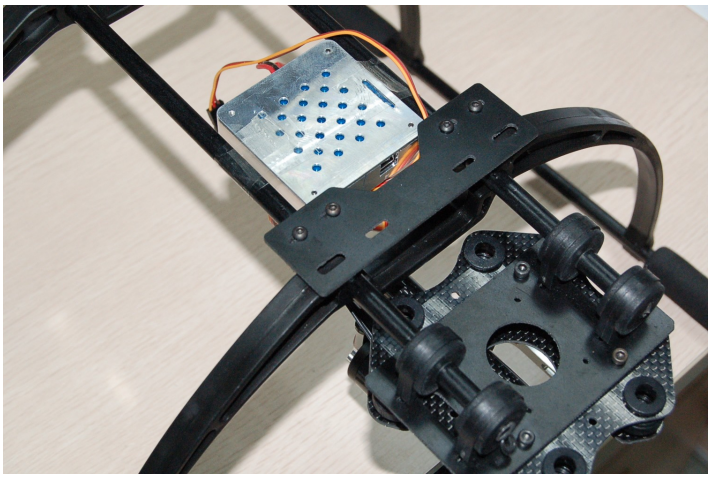
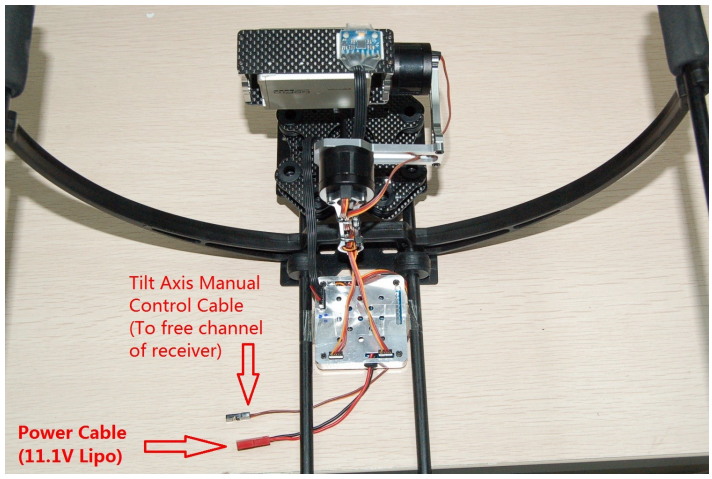
Step 2.
Insert the Tilt and Roll Controlling Connector into the Til and Roll Control Port on the Gimbal Controller.



Step 3.
Tilt Axis is controlled with 2-wire connector, and the Roll Axis is controlled with 1-wire connector. Connect these connectors into two free channels of your receiver. Adjust the limit of the channels as to limit the Tilt into +-60 degree, and Roll into +-80 degree or bellow for stable performance.



Step 4.
Connect IMU Unit cable to the IMU port of Gimbal Controller. And connect Tilt and Roll Motor cables to the motor ports of Gimbal Controller. *(Follow the exact direction for for all connections.)*

	
Step 5. Secure the Gimbal Controller on the landing gear or on the bottom frame of your F450/ F550 Multicopter with tap Adhesive Tapes, Zip Tie or double-sided foam tape.	Step 6. Bottom view of Gimbal Controller mounting on the landing gear. Connect the Tilt or Roll Axis Manual Control Connector to any free channels of your Receiver as to control the Tilt Axis manually. The Gimbal is recommended to power with 11.1V 3S Lipo Battery with JST connector.

9. Power On Steps

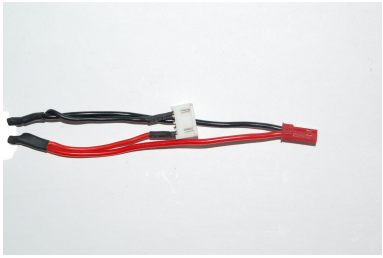
Before Power On the Gimbal:

1. Please check the polarity on IMU cable making sure the vcc and gnd are connected to correct pins.
2. Make sure the IMU is facing down when installing. Refer to IMU Mounting section.
3. We suggest to use 3s battery for GoPro or similar size cameras.
4. Double check the battery polarity before plugged in.
5. The Brushless Gimbal Controller is preset to plug-n-play with GoPro camera. There is no additional tuning needed.

Follow the following sequencies to power on your Senrigan-GP-45 Brushless Gimbal correctly.

Step 1.

Prepare a 2-3S 800mAh (recommended to use with 3S 11.1V) Lipo Battery which must has JST connector, or you can get the supply voltage from your 3S Lipo flying battery using a JST to 3S Balance Connector(not included).



Step 2.

Place the Senrigan-GP-45 Gimbal Assembly on the ground and keep it steady during the starting process.

Step 3.

Connect the Battery to the Power Cable of the Gimbal (JST connector) and wait for around 15 seconds. IMU is now initialing.(Do not move the Gimbal during the initialisation process, otherwise the Gimbal will fail to start!) After the Initialization Process, the Tilt and Roll Motors will move slowly to the center position. The camera will now be stayed in the level position.

If the Gimbal fail to start normally, reboot the power and try again. (Remember never move the Gimbal during the Initialization Process.)

Step 4.

Ready to go.

10. Troubleshooting

Q1: Why does the gimbal not stabilize the camera?

A: Please check the battery voltage and if the LED is lit.

Q2: Why is the gimbal not stabilizing the camera in right direction?

A: Please refer to installation and make sure the IMU Unit is installed at right orientation and the motors are connected to right pins.

Q3: Why is the gimbal shaking?

A: Usually it is caused be wrong IMU facing, please make sure it is facing down. Refer to IMU Mounting section.

Q4. Why is the captured video shaking?

A: Please ensure your Aircraft is well turned with minimum vibration before mounting the Gimbal. Double check the CG of the Camera, make sure the Camera is well balanced. Refer to CG Adjustment section.

Q4: Do I need to upgrade to latest version of firmware or adjust any parameters?

A: For this Basic Version, it is not necessary to upgrade the firmware or adjust any parameters unless further instruction is given. The Brushless Gimbal Controller is preset to plug-n-play with GoPro or simlar size camera. The gimbal controller is preset to give the best performance.

Q5: Where can I get more help for this product?

A: Please contact our distributors for warranty and customer service.

Report any mistakes, please email to: info@alwarerc.com

Related Videos could be found on: http://www.youtube.com/user/alwarerc

End Of Manual